

B1  
5 an accumulator pressure sensor including a first chamber in fluid communication with  
6 said irrigation line, a second chamber, and a flexible membrane that separates said first  
7 chamber from said second chamber and deflects in response to a change in an amount of  
8 fluid pressure in the irrigation line; and,  
9 a controller including a pressure transducer in fluid communication with said second  
10 chamber to detect a change of fluid pressure in said second chamber caused by the deflection  
11 of the flexible membrane and to adjust a flowrate of fluid passing through said irrigation line  
12 to counteract the change in the amount of fluid pressure in the irrigation line by varying a  
13 speed of said pump.

1 [2. Cancelled.]

B2 Pub C7  
1 3. The irrigation system of claim 1, further comprising a valve coupled to said  
2 irrigation line and said controller.

1 4. (Amended) The irrigation system of claim 1, wherein said controller activates  
2 an indicator to provide a warning to replace said irrigation reservoir.

B3 Pub C8  
1 5. (Twice Amended) The irrigation system of claim 1, wherein said  
2 controller varies said pump speed in response to a variation in the irrigation line pressure  
3 sensed by said pressure transducer that rises above a desired range of pressures.

B4 Pub C9  
1 6. The irrigation system of claim 1, wherein said controller can determine a  
2 flowrate generated by said pump.

B# Pub C9

7. The irrigation system of claim 6, wherein said controller determines an actual  
2 fluidic resistance from the flowrate and provides an output signal if the actual fluidic  
3 resistance is greater than a threshold value.

8. The irrigation system of claim 6, wherein said controller determines an actual  
2 volume of irrigation fluid pumped by said pump from the flowrate and provides an output  
3 signal if the actual volume of irrigation fluid is greater than a threshold value.

9. Cancelled.

10. Cancelled.

11. Cancelled.

12. Cancelled.

B5

Pub C10  
13. (Twice Amended) A medical system, comprising:  
2 an irrigation system that includes  
3 an irrigation reservoir,  
4 an irrigation pump that is coupled to said irrigation reservoir,  
5 an irrigation line coupled to said pump,  
6 an accumulator pressure sensor including a first chamber in fluid  
7 communication with said irrigation line, a second chamber, and a flexible membrane  
8 that separates said first chamber from said second chamber and deflects in response to  
9 a change in an amount of fluid pressure in the irrigation line, and,

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Pub C 10

10 a controller including a pressure transducer in fluid communication with said  
11 second chamber and to control the pressure within said irrigation line through  
12 monitoring a change of fluid pressure within said second chamber of said  
13 accumulator pressure sensor; and  
14 an aspiration system that includes  
15 an aspiration pump,  
16 an aspiration line coupled to said aspiration pump, and  
17 an aspiration pressure sensor that senses a vacuum pressure within said  
18 aspiration line.

1 14. Cancelled.

1 15. Cancelled.

B6  
Pub C 11

16. (Amended) The medical system of claim 13, wherein said controller  
2 maintains an intraocular pressure by varying a speed of said irrigation pump and a flowrate  
3 through said irrigation line.

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Pub C 12

1 17. (Twice Amended) The medical system of claim 16, wherein said  
2 controller varies said speed of said irrigation pump in response to a variation in fluid pressure  
3 in said first chamber of said accumulator pressure sensor as sensed by said pressure  
4 transducer.

B8  
Pub C 13

18. The medical system of claim 13, wherein said controller can determine a  
2 flowrate generated by said irrigation pump.

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19. The medical system of claim 18, wherein said controller determines an actual  
2 fluidic resistance from the flowrate and provides an output signal if the actual fluidic  
3 resistance is greater than a threshold value.

1 20. (Amended) The medical system of claim 18, wherein said controller  
2 determines an actual volume of irrigation fluid pumped by said irrigation pump from the  
3 flowrate and provides an output signal if the actual volume of irrigation fluid is greater than a  
4 threshold value.

1 21. (Amended) The medical system of claim 19, wherein said controller provides  
2 an output signal that is used to control power of a medical device that is coupled to said  
3 irrigation line and said aspiration line if the actual fluidic resistance is greater than a device  
4 threshold value.

1 22. (Amended) The medical system of claim 19, wherein said controller changes  
2 a speed of said aspiration pump if the actual fluidic resistance is greater than a threshold  
3 resistance value.

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1 23. Cancelled.

1 24. Cancelled.

1 25. Cancelled.

1 26. Cancelled.

1 27. Cancelled.

1 28. Cancelled.

1 29. Cancelled.

1 30. Cancelled.

1 31. Cancelled.

1 32. Cancelled.

1 33. Cancelled.

1 34. Cancelled.

*B9*  
*Sub C13*  
1 35. (Twice Amended) An apparatus, comprising:  
2 an irrigation pump;  
3 an irrigation line in fluid communication with the irrigation pump;  
4 a first pressure sensor in fluid communication with the irrigation line;  
5 an aspiration line;  
6 a second pressure sensor in fluid communication with the aspiration line;  
7 an aspiration pump in fluid communication with the aspiration line; and,  
8 a controller coupled with the first and the second pressure sensors to sense a  
9 differential pressure between the irrigation line and the aspiration line and to vary a speed of  
10 the irrigation pump in efforts to maintain a flow rate in the irrigation line substantially in

*BH*

11 proportion to the flow rate in the aspiration line.

1 36. Cancelled.

*BH* *Sub C15*  
1 37. (Amended) The apparatus of claim 35, further comprising:  
2 a first accumulator between the irrigation line and the first pressure sensor, the first  
3 accumulator including a first chamber in fluid communication with the irrigation line  
4 temporarily to provide said fluid in response to dislodgment of an occlusion of the aspiration  
5 line after the occlusion has already caused a substantially reduced speed of the irrigation  
6 pump, a second chamber in fluid communication with the first pressure sensor and a flexible  
7 membrane which separates the first and the second chamber.

*Cancelled*  
1 38. The apparatus of claim 37 wherein the first accumulator is sized to maintain  
2 an intraocular pressure of an eye into which the medical device is to be inserted.

1 39. The apparatus of claim 37, further comprising a second accumulator in fluid  
2 communication with the second chamber.

*BH* *Sub C16*  
1 40. The apparatus of claim 35, wherein the controller is further to determine that  
2 an occlusion of the aspiration line has occurred if the differential pressure increases.

*BH* *Sub C17*  
1 41. (New) An irrigation system for a medical device, comprising:  
2 a pump;  
3 an irrigation line coupled to said pump;  
4 a controller that varies a speed of said pump to adjust a flowrate of fluid passing  
5 through said irrigation line; and

*Pub C17*  
6 an accumulator including (i) a first chamber operating as a reservoir to store fluid  
7 separately from and fluid passing through said irrigation line, (ii) a second chamber and (iii)  
8 a flexible membrane that separates said first chamber from said second chamber, said  
9 accumulator provides said fluid from said first chamber to said irrigation line to maintain  
10 intraocular pressure of an eye.

*Fig*  
1 42. (New) The irrigation system of claim 41 further comprising an irrigation  
2 reservoir coupled to said irrigation line.

1 43. (New) The irrigation system of claim 42, wherein said fluid from said first  
2 chamber is provided to said irrigation line to mitigate transit latency of fluid from said  
3 irrigation reservoir.

1 44. (New) The irrigation system of claim 41, wherein said flexible membrane of  
2 said accumulator is deflected in response to a change in fluid pressure in said irrigation line  
3 and causes a change in fluid pressure in said second chamber.

1 45. (New) The irrigation system of claim 44, wherein said controller including a  
2 pressure transducer in fluid communication with said second chamber to detect the change of  
3 fluid pressure in said second chamber caused by deflection of said flexible membrane and to  
4 adjust a flowrate of said fluid passing through said irrigation line to counteract the change in  
5 fluid pressure in said irrigation line by varying the speed of said pump.

1 46. (New) The irrigation system of claim 42, wherein said controller activates an  
2 indicator to provide a warning to replace said irrigation reservoir.

1 47. (New) An irrigation system for a medical device, comprising:  
2 an irrigation line;  
3 a pump coupled to said irrigation line;

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4 an accumulator pressure sensor including a first chamber in fluid communication with  
5 said irrigation line, a second chamber, and a flexible membrane that separates said first  
6 chamber from said second chamber and deflects in response to a change in an amount of  
7 fluid pressure in the irrigation line; and,  
8 a controller including a pressure transducer in fluid communication with said second  
9 chamber, the controller to detect a change of fluid pressure in said second chamber caused by  
10 the deflection of the flexible membrane and to adjust a flowrate of fluid passing through said  
11 irrigation line to counteract the change in the amount of fluid pressure in the irrigation line by  
12 varying a speed of said pump.

Sub C19

1 48. (New) The irrigation system of claim 47, wherein the first chamber of the  
2 accumulator operating as a reservoir to store fluid separately from fluid passing through said  
3 irrigation line, said fluid provided from said first chamber to said irrigation line to  
4 temporarily maintain intraocular pressure of an eye

1 49. (New) The irrigation system of claim 48 further comprising an irrigation  
2 reservoir coupled to said irrigation line.

1 50. (New) The irrigation system of claim 49, wherein said fluid from said first  
2 chamber is provided to said irrigation line to account for a delay of additional fluid being  
3 provided from said irrigation reservoir.

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